Name _____ Date _____

Topic 8: Exponents

Write the following using exponents

Video Help: https://learnzillion.com/lessons/460-write-numerical-expressions-involving-wholenumber-exponents

Ex: $5 \times 5 \times 5 \times 5 = 5^4$

1) $2 \times 2 \times 2 \times 2 =$

2) $y \times y \times y \times y \times y \times y =$

3) $2m \times 2m \times 2m \times 2m \times 2m =$

4) $\frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} =$

Use the Product rule to simplify

Video Help: https://learnzillion.com/lessons/1514-multiply-two-or-more-exponential-expressions

Ex: $3^2 \times 3^4 = 3^6$

5) $2^5 \times 2^3 =$

6) $x^3 \times x^2 =$

7) $5^1 \times 5^3 =$

8) $2x^2 \times x^5 =$

9) $4y^3 \times 2y^7 =$

10) $(3x)^4 \times (3x)^2 =$

Use the Quotient rule to simplify

Video Help 1: https://learnzillion.com/lessons/1666-divide-exponential-expressions-by-noticing-patterns

Video Help 2: https://www.khanacademy.org/math/pre-algebra/exponents-radicals/exponent-properties/v/exponent-properties-involving-quotients

Ex: $\frac{3^6}{3^2} = 3^4$

11) $\frac{5^8}{5^2} =$

12) $\frac{7^6}{7} =$

13) $\frac{x^9}{x^2} =$

14) $\frac{(2x)^6}{(2x)^4} =$

15) $\frac{12y^{10}}{3y^2} =$

16) $\frac{32m^5}{4m^5} =$

Use the Power rule to simplify

Video Help 1: https://learnzillion.com/lessons/1515-raise-an-exponential-expression-to-a-power

Ex: $(x^4y^3)^2 = x^8y^6$

17) $(m^3)^5 =$

18) $(q^2r)^6 =$

19) $(4n^4)^2 =$

20) $(x^4y^3z^2)^3 =$

21) $(5f^3)^3 =$

22) $(2^3y^5)^2 =$

Negative Exponents

Video Help 1: https://learnzillion.com/lessons/1668-apply-a-negative-exponent-using-patterns-and-rules

Video Help 2: http://www.khanacademy.org/math/pre-algebra/exponents-radicals/negative-exponents-tutorial/v/negative-exponents

Ex: $x^{-2} = \frac{1}{x^2}$

23) $m^{-5} =$

24) $2^{-5} =$

25) $(4n)^{-3} =$

26) $(x^4y^3)^{-4} =$

27) $4n^{-3} =$

28) $(2y^5)^{-4} =$

Zero Exponents

Video Help: https://learnzillion.com/lessons/1667-apply-a-zero-exponent-using-patterns-and-rules

Ex: $x^0 = 1$

29) $m^0 =$

30) $2014^0 =$